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Date: October 6, 2010

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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
Before the Board of Patent Appeals and Interferences

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Appellant: David C. Schwartz, *et al.*	April 29, 2010
Serial No.: 10/713,898	Art Unit: 1637
Filing Date: October 18, 2002	Examiner: Stephanie K. Mummert
Title: MICRO FLUIDIC SYSTEM FOR SINGLE MOLECULE IMAGING	File No.: 960296.99047
Confirmation No.: 4216	

APPELLANT'S REPLY BRIEF

Mail Stop Appeal Brief – Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In response to the Examiner's Answer dated August 6, 2010, Appellant, David C. Schwartz *et al.*, submit the following Reply Brief under 37 C.F.R. § 41.41.

No fee is believed due in connection with this submission. However, if any fees are deemed to be due, the Commissioner is authorized to charge such fees to Deposit Account No. 17-0055.

I. Argument

Several points raised in the Examiner's Answer necessitate further comment by Appellant. Pages 3-12, first paragraph, of the Examiner's Answer are unresponsive to Appellant's arguments and amount to no more than a substantially verbatim copy of an Office Action dated December 2, 2009. Appellant first refuted the Examiner's arguments in Appellant's response to that Office Action and then in the Appeal Brief and so does not respond to this section of the Examiner's Answer. Appellant limits the Reply to those sections on pages 13-18 not taken verbatim from a previous Office Action or from Appellant's Brief.

A. CLAIMS 21, 23-24 AND 27 ARE NOT OBVIOUS UNDER 35 U.S.C. 103(A) OVER A COMBINATION OF PERKINS WITH BENSIMON.

Appellant had noted in their Appeal Brief that portions of documents relied upon by the Examiner do not teach the claimed feature and, in some instances, teach away from the claimed invention. The Examiner alleged that in doing so, Appellant raised arguments that amount "to a mere allegation of patentability" (Examiner's Answer, page 13, last paragraph-page 14, first paragraph). Appellant's arguments are not mere allegations of patentability. Regarding Perkins, the Examiner alleged that "the 'microchannel' formed between the cover slip and stage of Perkins spaced roughly 75 uM apart meets a broadest reasonable interpretation of a microchannel as claimed" (Examiner's Answer, page 14, second paragraph). If, in fact, the space between the microscope stage and the cover slip forms such channel, it is unclear why the Examiner relied on Perkin's footnote 26, which teaches, instead, that the microscope slide and cover slip are separated by 75 uM wires (Examiner's Answer, page 14, second paragraph). Moreover, Perkins is silent as to whether the molecule is within or outside of the gap between the cover slip and stage.

The Examiner alleged that "Perkins teaches a method of straightening and fixing polymeric molecules comprising the steps of: ...passing the polymeric molecules and carrier liquid through a micro-channel (Office Action, page 5, line 20, emphasis added). Perkins does not teach or suggest passing the molecule through a micro-channel. Even if a cover slip on a microscope stage could be considered a "microchannel," as the Examiner alleged, Perkins does

not teach "passing the molecule through a micro-channel." The Examiner improperly equates the polymer tethered/held between a cover slip and the microscope stage" (Examiner Answer, page 14, second paragraph) with "passing through," as recited by Appellant's claims. Perkins, in fact, does not teach this step, nor is this step a necessary precondition to the polymer being tethered/held between the cover slip and stage. Rather than forming the channel first and then passing the molecule through such channel, it is conceivable that the molecules adherent to the sphere were placed in position before adding the cover slip. As such, the Examiner failed to demonstrate that Perkins teaches passing a polymeric molecules through a micro-channel.

The Examiner further alleged that "uniform fluid flow" is synonymous with laminar flow (Examiner's Answer, page 15, second paragraph). Appellant disagrees. Laminar flow is a term of art that is not synonymous with "uniform fluid flow." Laminar flow is characterized by parallel flow lines. Perkins' microspheres create turbulence (Perkins, legend to FIG. 1B; page 84, right column). As such, the Perkins flow lines are not parallel and the flow cannot be laminar. Similarly, the flow taught by Bensimon is capillary, not laminar (Bensimon, FIG. 6; Column 2, lines 59-68; Column 17, lines 41-45; Column 19, lines 30-32) and Bensimon explicitly teaches away from using laminar flow (Bensimon, Column 4, lines 18-20). Because neither Perkins nor Bensimon teach or suggest using laminar flow, and because Bensimon, in fact, teaches away from using laminar flow, a combination of these two documents cannot render obvious the claimed invention.

Regarding attachment of the molecule to the microwell wall using laminar flow, the Examiner acknowledged that Perkins does not teach adhering the molecule to the microscope slide or stage (Examiner Answer, page 16, first paragraph), which the Examiner alleged to be equivalent to microwell walls. Bensimon also does not teach using laminar flow to attach the molecule. Rather, Bensimon uses capillary flow applied to already adhered molecules (Bensimon, FIG. 1, FIG. 3, column 1, lines 51-53;). As such, a combination of Perkins and Bensimon cannot make obvious Appellant's invention.

The Examiner alleged that Perkins does not teach "away from adherence of at least one end of the polymer" (Examiner Answer, page 16, second paragraph, emphasis added). The Appellant emphasizes that the claims recite that at least the first and second ends of the molecule

attach to the micro-channel wall. Perkins teaches attaching a DNA molecule to a microsphere at one end "while the other end remains free" (Perkins, page 83, right column, second paragraph, emphasis added). Thus, while the Examiner is correct that Perkins does not teach away from adhering one end of the polymer, Perkins teaches away from adhering at least the first and second ends of the molecule. Contrary to the Examiner's assertion, it is, in fact, "unreasonable to consider" (Examiner's Answer, page 16, second paragraph) attaching the second from reading Perkins because Perkins teaches keeping the polymer away from any surface (Perkins, page 83, right column).

Similarly, Bensimon's molecules are attached to a surface at one end but free in solution at the other end. The Examiner acknowledged that "this is a feature shared between Perkins and Bensimon" (Examiner's Answer, page 16, last paragraph). However, this feature is not shared by Appellant's invention, as the claims recite that at least the first and second ends attach to the micro-channel wall.

Regarding the removal of a microchannel wall, the Examiner alleged that "a careful reading of the passage indicates that during the process of alignment, denaturation and hybridization, the cover slip covering the aligned polymers is necessarily removed before the hybridization step" (Examiner's Answer, page 18, second paragraph). However, Bensimon teaches that the "previously denatured probes ... are deposited on the cover slip on hybridization solution...covered with a cover slip and sealed with rubber cement. The hybridization is carried out overnight" (Bensimon, column 19, lines 40-44). The cover slip is, thus, not removed prior to hybridization.

II. CONCLUSION

For the reasons stated above and in the Appeal Brief, Appellant respectfully requests reversal of the Examiner's final rejection of the claims.

Respectfully submitted,

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